OIPE



RAW SEQUENCE LISTING DATE: 02/14/2002 TIME: 19:31:56 PATENT APPLICATION: US/10/025,648

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## SEQUENCE LISTING

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4 (1) GENERAL INFORMATION:
             (i) APPLICANT: Bisgard-Frantzen, Henrik
      7
                            Svendsen, Allan
      8
                            Borchert, Torben Vedel
            (ii) TITLE OF INVENTION: AMYLASE VARIANTS
     10
     12
           (iii) NUMBER OF SEQUENCES: 32
            (iv) CORRESPONDENCE ADDRESS:
     14
                  (A) ADDRESSEE: Novo Nordisk of North America, Inc.
     15
                  (B) STREET: 405 Lexington Avenue, Suite 6400
     16
     17
                  (C) CITY: New York
                  (D) STATE: New York
     18
                                                                ENTERED
     19
                  (E) COUNTRY: U.S.A.
     20
                  (F) ZIP: 10174-6401
     22
             (v) COMPUTER READABLE FORM:
     23
                  (A) MEDIUM TYPE: Floppy disk
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                  (B) COMPUTER: IBM PC compatible
                  (C) OPERATING SYSTEM: PC-DOS/MS-DOS
     25
                  (D) SOFTWARE: PatentIn Release #1.0, Version #1.25 (EPO)
     26
     28
            (vi) CURRENT APPLICATION DATA:
C--> 29
                  (A) APPLICATION NUMBER: US/10/025,648
C--> 30
                  (B) FILING DATE: 19-Dec-2001
     36
                  (C) CLASSIFICATION:
           (vii) PRIOR APPLICATION DATA:
     33
                  (A) APPLICATION NUMBER: 08/600,656
     34
     35
                  (B) FILING DATE: 13-FEB-1996
          (viii) ATTORNEY/AGENT INFORMATION:
     39
                  (A) NAME: Lambiris, Elias J.
                  (B) REGISTRATION NUMBER: 33,728
     40
     41
                  (C) REFERENCE/DOCKET NUMBER: 4318.204-US
            (ix) TELECOMMUNICATION INFORMATION:
     43
     44
                  (A) TELEPHONE: 212 867 0123
                  (B) TELEFAX: 212 867 0298
     45
     48 (2) INFORMATION FOR SEQ ID NO: 1:
             (i) SEQUENCE CHARACTERISTICS:
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                  (A) LENGTH: 485 amino acids
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     52
                  (B) TYPE: amino acid
                  (C) STRANDEDNESS: single
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     54
                  (D) TOPOLOGY: linear
            (ii) MOLECULE TYPE: peptide
     58
            (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:
             His His Asn Gly Thr Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Tyr
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63 64	ьец	PIO	ASII	20	GIY	ASII	птэ	ттр	25	Arg	пеп	Arg	АБР	30	AIG	ALG
	N a n	Ton	Tvra		Tuc	Gly	Tlo	Πh.~		17 a 1	Пrn	Tla	Dro		<b>λ</b> Ις	Фrn
66 67	ASII	ьеu	ду 5 35	261	пуз	GLY	TIE	40	Ата	Val	TTD	TTC	45	FIO	AIG	115
69	Tvc	C1 11		Car	Cln	Asn	N c n	-	Gl v	ттт	Glw	7.1 s		Acn	T.011	ጥላታ
70	цуб	50	T111	261	GIII	ASII	55	vaı	GLY	тут	Gry	60	тут	nsp	рси	- y -
70 72	N c n		C117	C1.,	Dho	Asn		Tare	Clu	Thr	Val		Thr	Luc	ጥኒኒዮ	Glv
72	65	ьeu	GIY	GIU	FIIE	70	GIII	пур	GIY	TIIT	75	AIG	1111	пуъ	TYT	80 80
75		λνα	λcn	Cln.	Tau	Gln	λla	λla	V = 1	Фhr		T.Ou	T.sze	λen	λen	
75 76	TIIT	AIG	ASII	GIII	85	GIII	Ата	Ата	Val	90	261	цец	цуз	ASII	95	GLY
78	Tlo	Gln	Val	ጥህጉ		Asp	Val	Va 1	Met		Hic	T.vs	Glv	Glv		Asn
70 79	110	GIII	val	100	GLY	пор	<b>V</b> 41	<b>V</b> 41	105	non	1110	цуо	013	110	2114	110P
81	Gl v	ጥh r	Glu		Val	Asn	Δla	Val		Val	Δsn	Ara	Ser		Ara	Asn
82	GI Y	T 111	115	110	741	71011	mru	120	Olu	, u _		9	125		•••	
84	Gln	Glu		Ser	Glv	Glu	Tvr		Tle	Glu	Ala	Trp		Lvs	Phe	Asp
85	0111	130		001	017	014	135			0 <b>. u</b>		140				
87	Phe		Glv	Arσ	Glv	Asn		His	Ser	Ser	Phe		Trp	Ara	Trp	Tvr
88	145	110	011	5	<b>Φ</b> ±1	150					155			5		160
90		Phe	Asp	Glv	Thr	Asp	Trp	Asp	Gln	Ser		Gln	Leu	Gln	Asn	
91				011	165					170	,				175	-1-
93	Tle	Tvr	Lvs	Phe		Gly	Thr	Glv	Lvs		Trp	Asp	Trp	Glu		Asp
94		-1-	_1_	180	5	1		1	185					190		<b>L</b>
96	Thr	Glu	Asn		Asn	Tyr	Asp	Tvr		Met	Tvr	Ala	Asp	Val	Asp	Met
97			195	1		-1-		200			-1-		205			
99	Asp	His		Glu	Val	Ile	His		Leu	Arq	Asn	Trp	Gly	Val	Trp	Tyr
										)						
100		210	)				215	,				220				-
100 102	Thr	210 Asr		Leu	. Asr	Leu			. Phe	. Arc	r Ile			. Val	. Lys	_
102	Thr 225	Asr		Leu	ı Asr	Leu 230	Asp		Phe	e Arg	1le 235	Asp		Val	Lys	- His 240
102 103	225	Asr	n Thr			230	Asp	Gly		_	23,5	Asp	Ala			His 240
102	225	Asr	n Thr			230 Thr	Asp	Gly		_	235 Thr	Asp	Ala			His 240 Thr
102 103 105	225 Ile	Asr Lys	Thr Tyr	Ser	Phe 245	230 Thr	Asp Arg	Gly Asp	Trp	Leu 250	235 Thr	Asp His	Ala Val	. Arg	7 Asn 255	His 240 Thr
102 103 105 106	225 Ile	Asr Lys	Thr Tyr	Ser	Phe 245 Met	230 Thr	Asp Arg	Gly Asp	Trp	Leu 250	235 Thr	Asp His	Ala Val	. Arg	Asn 255 Asp	His 240 Thr
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102 103 105 106 108 109	225 Ile	Asr Lys	Thr Tyr Lys	Ser Pro 260	Phe 245 Met	230 Thr	Asp Arg	Gly Asp Val	Trp Ala 265	Leu 250 Glu	235 Thr	Asp His	Val	Arg Asn 270 His	Asn 255 Asp	His 240 Thr
102 103 105 106 108 109	225 Ile Thr	Asr Lys Gly Ala	Thr Tyr Lys 11e 275	Ser Pro 260	Phe 245 Met	230 Thr Phe	Asp Arg Ala	Asp Val Asn 280	Ala 265 Lys	Leu 250 Glu Thr	235 Thr Phe	Asp His Trp	Val Val Lys Asn 285	Arg Asr 270 His	Asn 255 Asp Ser	His 240 Thr
102 103 105 106 108 109 111 112	225 Ile Thr	Asr Lys Gly Ala	Thr Tyr Lys 11e 275 Val	Ser Pro 260	Phe 245 Met	230 Thr Phe	Asp Arg Ala	Asp Val Asn 280	Ala 265 Lys	Leu 250 Glu Thr	235 Thr Phe	Asp His Trp	Val Val Lys Asn 285	Arg Asr 270 His	Asn 255 Asp Ser	His 240 Thr Leu
102 103 105 106 108 109 111 112	225 Ile Thr Gly Phe	Asr Gly Ala Asr 290	Thr Tyr Lys Ile 275 Val	Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser	Phe 245 Met	230 E Thr 5 Phe 1 Tyr	Asp Arg Ala Leu Tyr 295	Asp Val Asn 280	Trp Ala 265 Lys	Leu 250 Glu Thr	235 Thr Phe Ser	Asp His Trp Trp	Ala Val Lys Asn 285	Arg Asr 270 His	Asn 255 Asp Ser	His 240 Thr Leu
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102 103 105 106 108 109 111 112 114 115 117 118 120 121 123 124 126 127 129	225 Ile Thr Gly Phe Gly 305 His	Asr Clys Ala Asr 290 Tyr Clu Ala Asr 370	Thr Tyr Lys 275 Val Tyr Thr Ala Leu 355 Tyr	Pro 260 e Glu Pro Asp His 340 Val	Phe 245 Met Asr Ala 325 Glu Leu	230 E Thr E Phe Tyr His Arg 310 Val E Ser Thr	Asr Arg Ala Leu Tyr 295 Asr Thr Phe	Asp Val Asp 280 Asp Ile Phe Val 360 Thr	Ala 265 Lys Leu Leu Val Gln 345 Gln	Detail 250 Control Tyr Asr Asr Glr Gly Gly	235 Thr Phe Ser Asn Gly 315 Asn Trp Tyr	Asp His Trp Trp Ala 300 Ser His Phe	Ala Val Val Asn 285 Ser Val Asp Lys Ser 365 Ala	Asn 270 His Asn Val Ser 350 Val	Asn 255 Asp Ser Ser Gln 335 Leu	His 240 Thr Leu Val Gly Lys 320 Pro Ala Tyr
102 103 105 106 108 109 111 112 114 115 117 118 120 121 123 124 126 127 129 130	225 Ile Thr Gly Phe Gly 305 His Gly Tyr Gly Lys 385	Asr Gly Ala Asr 290 Tyr Glu Ala 370 Gli Gli	Thr Tyr Lys A Ile 275 Val Tyr Thr Ala A Leu 355 Tyr	F Ser 260 260 Glu Pro Asp His 340 Val	Phe 245 Met Asr Ala 325 Glu Leu Gly	230 E Thr E Phe Tyr His Arg 310 Val Ser Thr Ile	Asp Arg Ala Leu Tyr 295 Asr Arg Phe 375	Asp Val Asp 280 Asp Ile Val Glu 360 Thr	Ala 265 Lys Leu Leu Val Gln 345 Gln	D Letter 250 and 250 a	235 Thr Phe Ser Asn Gly 315 Asn Trp Tyr Val	Asp His Trp Ala 300 Ser His Phe Pro 380 Phe	Alas Val	Arg Asr 270 His Asr Val Ser 350 Val Met	Asn 255 Asp Ser Ser Gln 335 Leu Phe	His 240 Thr Leu Val Gly Lys 320 Pro Ala

136						405					410					415	
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139		_			420					425					430		
141		Gly	Pro	Gly	Gly	Asn	Lys	Trp	Met	Tyr	Val	Gly	Lys	Àsn	Lys	Ala	Gly
142				435					440					445			
144		Gln	Val	Trp	Arg	Asp	Ile	Thr	Gly	Asn	Arg	Thr	Gly	Thr	Val	Thr	Ile
145			450					455					460				
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158				) TYI					1 =								
159			•	) STI				_	Le								
160		/ : : \	-	) TO										•			
162 164		(ii) (xi)				-	-		יד מי	) NO							
166				Asn					-			Gln	ጥህን	Phe	Glu	Tro	His
167		1	1115	ASII	GLY	5	ASII	GLY	1111	rict	10	GIII	+ 1 +	1110	Olu	15	1115
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179		65					70					75					80
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182						85					90					95	
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190		Gln		Ile	Ser	Gly	Asp	_	Thr	Ile	Glu	Ala		Thr	Lys	Phe	Asp
191		-1	130	<b>4</b> 3	•	<b>a</b> 1	•	135	m	0	<b>3</b>	Dh.	140	m	7	m	M
193			Pro	Gly	Arg	GTĀ		Thr	TAL	ser	Asp		гаг	тгр	Arg	тгр	160
194		145	Dho	7 ~~	C1	370.1	150	mxx	7 ~ ~	Cln	Cor	155	Cln	Dho	Cln	λan	
196 197		nis	Pne	Asp	GIY	165	ASP	пр	ASP	GIII	170	AIG	GIII	FILE	GIII	175	AIG
199		Tlo	Пих	Lys	Dho		Glv	Acn	Glw	T.sze		mrn	Acn	Trn	Glu		Acn
200		116	тут	цуъ	180	AIG	GLY	иор	GLY	185	AIG	111	пор	P	190	vai	пор
202		Ser	Glu	Asn		Asn	Tvr	Asp	Ͳvr		Met	Tvr	Ala	Asp		Asp	Met
203		001	Olu	195	~ <b>-</b> 1		-1-		200			-1-		205			
205		Asp	His	Pro	Glu	Val	Val	Asn		Leu	Ara	Ara	Trp		Glu	Trp	Tyr
206			210					215	·		- J		220	- 4		•	-
208		Thr		Thr	Leu	Asn	Leu		Gly	Phe	Arg	Ile	Asp	Ala	Val	Lys	His
209		225					230	-	_		_	235	=				240

212 214  Thr Gly Lys Glu Met Phe Ala Val Ala Glu Phe Trp Lys Asn Asp Let 215 2260 2270 217  Gly Ala Leu Glu Asn Tyr Leu Asn Lys Thr Asn Trp Asn His Ser Val 218 220  Phe Asp Val Pro Leu His Tyr Asn Leu Tyr Asn Ala Ser Asn Ser Gly 221 220  Cly Asn Tyr Asp Met Ala Lys Leu Leu Asn Gly Thr Val Val Gln Ly 305 221 233  Cly Asn Tyr Asp Met Ala Lys Leu Leu Asn Gly Thr Val Val Gln Ly 315 224 305  His Pro Met His Ala Val Thr Phe Val Asp Asn His Asp Ser Gln Page 1250  255 270 270 270 270 285 287 288 289 289 280 289 280 285 280 285 280 285 287 287 288 289 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 300 295 295 300 295 295 300 295 295 300 295 295 295 295 295 295 295 295 295 295	
217 Gly Ala Leu Glu Asn Tyr Leu Asn Lys Thr Asn Trp Asn His Ser Va 218 275 280 285 220 Phe Asp Val Pro Leu His Tyr Asn Leu Tyr Asn Ala Ser Asn Ser Gl 221 290 295 300 223 Gly Asn Tyr Asp Met Ala Lys Leu Leu Asn Gly Thr Val Val Gln Ly 224 305 310 315 32	al
218       275       280       285         220       Phe Asp Val Pro Leu His Tyr Asn Leu Tyr Asn Ala Ser Asn Ser Gl         221       290       295       300         223       Gly Asn Tyr Asp Met Ala Lys Leu Leu Asn Gly Thr Val Val Gln Ly         224       305       310	ат
221 290 295 300 223 Gly Asn Tyr Asp Met Ala Lys Leu Leu Asn Gly Thr Val Val Gln Ly 224 305 310 315 32	
Gly Asn Tyr Asp Met Ala Lys Leu Leu Asn Gly Thr Val Val Gln Ly 305 ' 310 315 32	ly
224 305 ' 310 315 32	
220 MID 110 Met MID MIG VOL 1M 1M VOL MDP MDM MID MDP DOL CIM 1.	
227 325 330 335	
229 Gly Glu Ser Leu Glu Ser Phe Val Gln Glu Trp Phe Lys Pro Leu Al	la
230 340 345 350	
232 Tyr Ala Leu Ile Leu Thr Arg Glu Gln Gly Tyr Pro Ser Val Phe Ty	yr
233 355 360 365	_
235 Gly Asp Tyr Tyr Gly Ile Pro Thr His Ser Val Pro Ala Met Lys Al	la
236 370 375 380	h m
238 Lys Ile Asp Pro Ile Leu Glu Ala Arg Gln Asn Phe Ala Tyr Gly Th 239 385 390 395 40	00
239 363 40 241 Gln His Asp Tyr Phe Asp His His Asn Ile Ile Gly Trp Thr Arg Gl	
242 405 410 415	
244 Gly Asn Thr Thr His Pro Asn Ser Gly Leu Ala Thr Ile Met Ser As	sp
245 420 425 430	-
247 Gly Pro Gly Gly Glu Lys Trp Met Tyr Val Gly Gln Asn Lys Ala Gl	ly
248 435 440 445	
250 Gln Val Trp His Asp Ile Thr Gly Asn Lys Pro Gly Thr Val Thr Il	le
251 450 455 460	
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256 Ile Trp Val Lys Arg 257 485	
260 (2) INFORMATION FOR SEQ ID NO: 3:	
262 (i) SEQUENCE CHARACTERISTICS:	
263 (A) LENGTH: 514 amino acids	
264 (B) TYPE: amino acid	
265 (C) STRANDEDNESS: single	
266 (D) TOPOLOGY: linear	
268 (ii) MOLECULE TYPE: peptide	
270 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:	
272 Ala Ala Pro Phe Asn Gly Thr Met Met Gln Tyr Phe Glu Trp Tyr Le	eu
273 1 5 10 15	
275 Pro Asp Asp Gly Thr Leu Trp Thr Lys Val Ala Asn Glu Ala Asn As	sn
276 20 25 30 30 378 Tour Con Con Lou Clar The Three No. 100 Three True True True True True True True T	
278 Leu Ser Ser Leu Gly Ile Thr Ala Leu Trp Leu Pro Pro Ala Tyr Ly 279 35 40 45	yъ
281 Gly Thr Ser Arg Ser Asp Val Gly Tyr Gly Val Tyr Asp Leu Tyr As	gg
282 50 55 60	
Leu Gly Glu Phe Asn Gln Lys Gly Ala Val Arg Thr Lys Tyr Gly Th	hr

285	65					70					75					80
287		Ala	Gln	Tvr	Leu		Ala	Ile	Gln	Ala	Ala	His	Ala	Ala	Gly	Met
288	-1 -			-1-	85					90					95	
290	Gln	Val	Tvr	Ala		Val	Val	Phe	Asp	His	Lys	Gly	Gly	Ala	qaA	Gly
291			-1-	100					105		•	•	•	110	•	-
293	Thr	Glu	Trp		Asp	Ala	Val	Glu	Val	Asn	Pro	Ser	Asp	Arq	Asn	Gln
294			115		<u>F</u>			120					125			
296	Glu	Ile		Glv	Thr	Tvr	Gln		Gln	Ala	Trp	Thr	Lys	Phe	Asp	Phe
297		130		1		-1-	135				1	140			•	
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302		Asp	Glv	Val	Asp		Asp	Glu	Ser	Arg	Lvs	Leu	Ser	Arq	Ile	Tyr
303			1		165					170	-			_	175	-
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308	Asn	Glv	Asn	Tyr	Asp	Tyr	Leu	Met	Tyr	Ala	Asp	Leu	Asp	Met	Asp	His
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314	Thr		Asn	Ile	Asp	Gly	Phe	Arq	Leu	Asp	Ala	Val	Lys	His	Ile	Lys
315	225			,	-	230		_		-	235					240
317		Ser	Phe	Phe	Pro	Asp	Trp	Leu	Ser	Asp	Val	Arg	Ser	Gln	Thr	Gly
318					245	•	•			250		_			255	_
320	Lvs	Pro	Leu	Phe	Thr	Val	Gly	Glu	Tyr	Trp	Ser	Tyr	Asp	Ile	Asn	Lys
321	1			260			•		265	-		-	-	270		_
323	Leu	His	Asn		Ile	Met	Lys	Thr	Asn	Gly	Thr	Met	Ser	Leu	Phe	Asp
324			275				-	280		•			285			_
326	Ala	Pro	Leu	His	Asn	Lys	Phe		Thr	Ala	Ser	Lys	Ser	Gly	Gly	Thr
327		290				•	295	•				300		_	_	
329	Phe	Asp	Met	Arg	Thr	Leu	Met	Thr	Asn	Thr	Leu	Met	Lys	Asp	Gln	Pro
330	305	_		-		310					315					320
332	Thr	Leu	Ala	Val	Thr	Phe	Val	Asp	Asn	His	Asp	Thr	Glu	Pro	Gly	Gln
333					325					330					335	
335	Ala	Leu	Gln	Ser	Trp	Val	Asp	Pro	Trp	Phe	Lys	Pro	Leu	Ala	Tyr	Ala
336				340					345					350		
338	Phe	Ile	Leu	Thr	Arg	Gln	Glu	Gly	Tyr	Pro	Cys	Val	Phe	Tyr	Gly	Asp
339			355					360					365			
341	Tyr	Tyr	Gly	Ile	Pro	Gln	Tyr	Asn	Ile	Pro	Ser	Leu	Lys	Ser	Lys	Ile
342		370					375					380				
344	Asp	Pro	Leu	Leu	Ile	Ala	Arg	Arg	Asp	Tyr	Ala	Tyr	Gly	Thr	Gln	His
345	385					390					395					400
347	Asp	Tyr	Leu	Asp	His	Ser	Asp	Ile	Ile	Gly	Trp	Thr	Arg	Glu	Gly	Val
348					405					410					415	
350	Thr	Glu	Lys	Pro	Gly	Ser	Gly	Leu	Ala	Ala	Leu	Ile	Thr	Asp	Gly	Pro
351				420					425					430		
353	Gly	Gly	Ser	Lys	Trp	Met	$\mathtt{Tyr}$	Val	Gly	Lys	Gln	His	Ala	Gly	Lys	Val
354			435					440					445			
356	Phe	Tyr	Asp	Leu	Thr	Gly		Arg	Ser	Asp	Thr		Thr	Ile	Asn	Ser
357		450					455					460				

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/025,648

DATE: 02/14/2002

TIME: 19:31:58

Input Set : N:\Crf3\RULE60\10025648.txt
Output Set: N:\CRF3\02142002\J025648.raw

L:29 M:220 C: Keyword misspelled or invalid format, [(A) APPLICATION NUMBER:]

L:30 M:220 C: Keyword misspelled or invalid format, [(B) FILING DATE:]